

Amendments to the Claims:

Claims 1-29 (cancelled).

Claim 30 (previously presented): A mass separator comprising:

first and second sets of electrode components, individual ones of the components comprising a surface, wherein, in a cross section, the surfaces of the first set of components oppose each other, the surfaces of the second set of components oppose each other, and the surfaces of the first and second sets of components define a volume, the volume comprising a first distance corresponding to a half a distance intermediate opposing surfaces of the first of components and a second distance corresponding to a half a distance intermediate opposing surfaces of the second set of components, wherein, a ratio of the first distance to the second distance comprises from about 0.84 to about 1.2; and

wherein the mass separator comprises a cylindrical ion trap and the surface of the first component comprises the surface of at least one of the end caps of the ion trap and the surface of the second component comprises the inner surface of the ring electrode of the ion trap, the cylindrical ion trap comprising an electrode spacing distance between individual ones of the end caps and the ring electrode, wherein the electrode spacing distance is related to the ratio by a spacer maximum factor and the electrode spacing distance is less than the product of the spacer maximum factor times the second distance.

Claim 31-32 (cancelled).

Claim 33 (previously presented): The mass separator of claim 30 wherein the end caps comprise stainless steel mesh.

Claim 34 (original): The mass separator of claim 30 wherein the first set of components are orthogonally related to the second set of components.

Claims 35-67 (cancelled).

Claim 68 (previously presented): The mass separator of claim 30 wherein at least one of the end caps comprises a solid material having a centrally located aperture.

Claim 69 (previously presented): The mass separator of claim 30 wherein at least one of the end caps comprises mesh.

Claim 70 (cancelled).

Claim 71 (previously presented): The mass separator of claim 30 wherein at least one of the end caps further comprises an opening.

Claim 72 (previously presented): The mass separator of claim 71 wherein the opening is aligned with the volume center.

Claim 73-75 (cancelled).

Claim 76 (previously presented): The mass separator of claim 30 wherein the mass separator is coupled to a mass detector.